AMERICAN
STATISTICAL ASSOCIATION.

NEW SERIES, No. 100. DECEMBER, 1912

THE USE OF AVERAGES IN EXPRESSING THE WAGES AND HOURS OF MILWAUKEE STREET CAR TRAINMEN.

By Horace Secrist, Ph.D., *Statistician, Wisconsin Industrial Commission.*

The Wisconsin Industrial Commission, whose duty it is to administer the Workmen's Compensation Act, is required to enforce the provision of the Industrial Commission Law.* This law specifies among other things that employers "shall do every other thing reasonably necessary to protect the life, health, safety and welfare" of its employees and frequenters. The term "welfare," as defined in the law, means and includes "comfort, decency and moral well being." In order to take advantage of this provision of the law, as well as those which require the Commission to promote voluntary arbitration, mediation, and conciliation of disputes between employers and employees, the Amalgamated Association of Street and Electric Railway Employees of America, in behalf of its membership, submitted a list of grievances which set forth the conditions of the street railway employees of The Milwaukee Electric Railway and Light Company of Milwaukee. Among the grievances were those of "long hours of duty," "long periods of steady service without leave of absence running into three months, seven days a week, in many cases," being "required to report many times a day and held on duty without pay," and "insufficient wages."

The Commission, upon the receipt of these grievances and after the offer of mediation was declined by the company, held a public hearing, and afterwards made an examination of the pay rolls of the company in order to weigh the grievances of the representatives of the union as respects wages, hours,

* Chapter 485, Laws of 1911.

etc. It is with these questions in their relation to averages that this paper has to do. It is written in order to show, as respects these subjects, the methods used by the Commission to arrive at its findings. No claim of novelty is made for the methods here presented, neither has the writer made use of some of the standard methods. It is hoped, however, that some light may be thrown upon the proper uses to which common statistical measures may be put in the solution of a concrete statistical problem.

It was necessary to go to the company for data on wages, hours, time off, etc. The company employs 1,211 trainmen, divided among seven stations. The Commission examined the pay rolls at two stations—one where conditions were best and one where conditions seemed to be the worst—for 306 regular men and 100 extra men, during the periods December 1–15 for all the men then employed at these stations, and from July 1 to December 31 for all men at these stations who had been with the company one continuous year ending December 31, 1911. Investigations of pay rolls for December 1–15 were also made for comparative purposes at single stations in Chicago, Cleveland, and Detroit. Hourly wages were gotten for all trainmen at Milwaukee, and monthly wages as well as the number of full days each man worked in each pay—two-weeks—period for the men at two stations.

For extra trainmen, a complete history of each man's operations for the company over a period of seven days was recorded. For these men, the time of beginning duty each day whether "waiting," "watching," "car change," or beginning a run was separately recorded, as were also the time of the completion of each part of his day's duty, and the hour of the completion of his day's work. These data were collected from the blue prints of the scheduled runs, as well as the day books of the Company, and give accurate information on the length of platform duty, the time paid for, the spread of duty, the number of times which the men reported during a given period, etc.

For the regular men,—those holding runs beginning and ending at the same time of the day and sharing in the privilege of choosing their runs, etc.—the week-day, Saturday, and

Sunday schedules of each crew, as they existed during December, 1911, were taken from the blue prints furnished by the company, and show for each man, besides the facts noted above, the number of shift, periods or parts to each run, and the kind of run whether "day," "night," "swing," or "owl." Other data on causes for absence from duty, etc. were collected and served, with the facts above noted, when tabulated in detail, to determine the findings of the Commission. The discussion of wages, hours, etc. refers to regular men only, inasmuch as no authoritative data on these subjects were available for extra men for other cities. The relative condition of regular and extra men at Milwaukee was fully considered by the Commission, but no discussion of their conditions or the Commission's findings are here given.

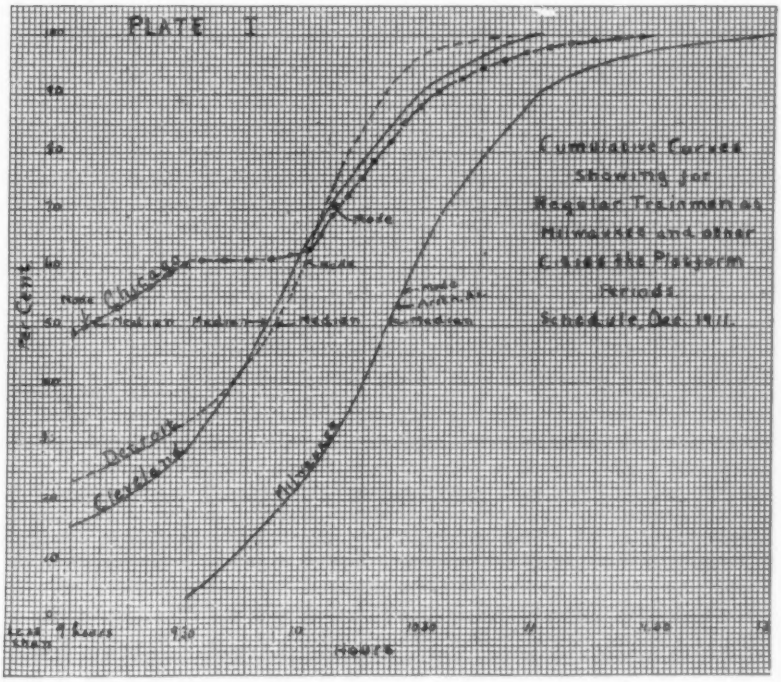
On the question of wages and hours, the representatives of the company contended that average conditions at Milwaukee as respects trainmen were as favorable as average conditions in other cities. The average man, it was maintained, was working ten hours per day and earning approximately $75 per month, with little fear of "shut downs," "slack seasons," etc. Just who these "average" persons were who would compare favorably with "average" persons some place else, was not pointed out by the company. The Commission, on the other hand, in order to make its findings accurate and fair, both to the company and the employees, was forced to determine not the "average" but the actual conditions, and these involved earnings, platform duty, hours worked, as well as the time off during a given period, etc. It is the relationship of the average conditions to the actual conditions which is worked out in this paper. The precise weight which can be given to conclusions based on average earnings, average platform duty, average hours per pay, and average time off per pay is indicated in following account on conditions of trainmen in Milwaukee and the cities named.

The average number of hours worked during the period December 1–15, 1911, at Milwaukee, for the 270 trainmen whose schedules were recorded was 137.5 hours. The average length of the working day for the schedule in effect in December, 1911, was 10 hours 19 minutes. This represents 26 days

of the average length. The average hourly rate of 25.3 cents of these men when applied to the average number of hours worked—275—(i.e. 137.5 multiplied by two so as to give a full month) gives an average monthly pay of $69.57. That is, the average man works 26 days each month of 10 hours 19 minutes each day in order to earn on the average $69.57. But the average monthly pay actually received was not $69.57 but $71.40, which gives an average hourly rate of pay of 25.9 cents. This is not the true average, however, since this rate when computed from the several rates of pay and number of men at these rates is 25.3 cents. To show the unreliability of basing conclusions on the average alone, the average hourly rate at Twelfth Street and Farwell Avenue stations—those investigated—for regular men may be applied to the total number of hours worked during the one-half month, December 1–15, 1911, and this amount may then be compared with the pay which the men actually received. The total number of hours worked during this period was 37,143 and the average hourly pay for the men receiving it was 25.3 cents. The amount theoretically received, therefore, was $9,397. But the amount actually received was $9,871 or $474 more than this theoretical amount and this is necessarily so because the work at these stations was theoretically worth 25.9 cents per hour when figured on the basis of the average monthly pay.

The use of an average here is wholly unreliable, because the actual man and the actual conditions are not described—only an average man, and average conditions are being dealt with, and these may never exist. In fact, there are no men working 10 hours and 19 minutes per day, neither are there men receiving $71.40 per month. The actual distribution of platform duties for Milwaukee and the other cities named is shown graphically on Plate I, and for Milwaukee separately on Plate II.

Plate I is constructed so as to show for each city named the percentage of runs at or less than a given number of hours. From these curves the percentage of runs at or less than any period may easily be read and some interesting comparisons made. Table I drawn from Plate I shows for Milwaukee,



Cleveland, Detroit, and Chicago, respectively, the per cent. of their regular runs which were less than the specified number of hours.

TABLE I.

SHOWING THE PER CENT. OF REGULAR RUNS AT MILWAUKEE, CLEVELAND DETROIT, AND CHICAGO, WHICH WERE LESS THAN THE SPECIFIED NUMBER OF HOURS IN LENGTH.

Hours.	Milwaukee.	Cleveland.	Detroit.	Chicago.
Less than 9:00.	.....	16.67*	23.68	49.09
Less than 9:30.	3.27	29.48	34.20	61.82
Less than 10:00.	24.83	64.10	63.15	63.64
Less than 10:30.	63.40	91.02	97.36	89.08
Less than 11:00.	90.84	100.00	100.00	98.18
Less than 11:30.	98.04	.....	.....	100.00
Less than 12:00.	100.00	.....	.....	.....

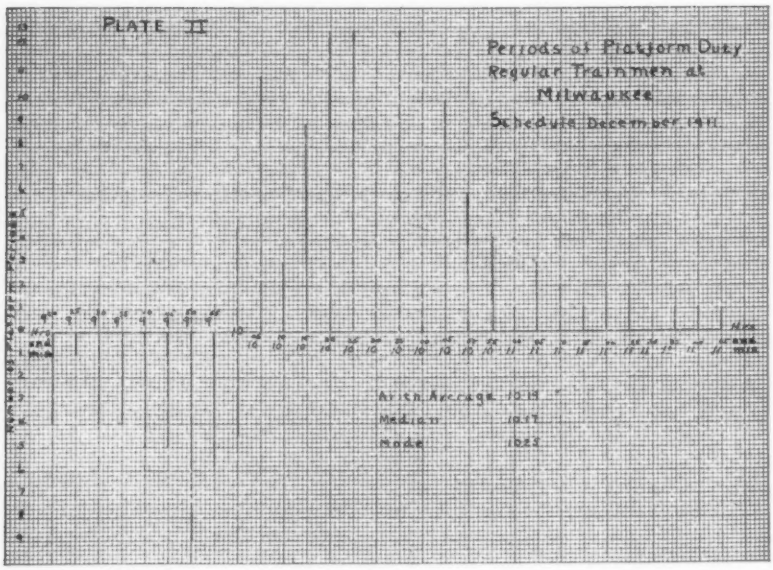


Plate II is so constructed as to show the distribution of the runs at Milwaukee as they arrange themselves above and below 10 hours and to bring out just how unsatisfactory and unreal is an arithmetic average in expressing real conditions. The three averages, mode, median, and arithmetic average are indicated on this Plate.

If an hour at Milwaukee is worth 25.3 cents on the average, and the average man to get $69.57 is forced to work 10 hours and 19 minutes each day for 26 days, then all those who have shorter periods than 10 hours, or who get less than the average hourly rate of pay, receive something less than the average monthly pay. The loss experienced by men who work less than 10 hours 19 minutes, and still receive the average hourly rate of pay, may be expressed in the tabular form:

Time in run.	Amount less than average. (minutes.)	Men at this time.	Total time.	Worth of this time at 25c. per hour.
10:15	5	9	0.45	$0.19
10:10	10	3	0.30	0.12
10:05	15	11	2.45	0.69
10:00	20	9	3.00	0.76
9:55	25	6	2.30	0.63
9:50	30	9	4.30	1.13
x	x	x	x	x
x	x	x	x	x
9:20	1.00	4	4.00	1.01.

On the other hand, the gain experienced by men who work longer than the average time and receive the average hourly rate of pay may be expressed in the same way.

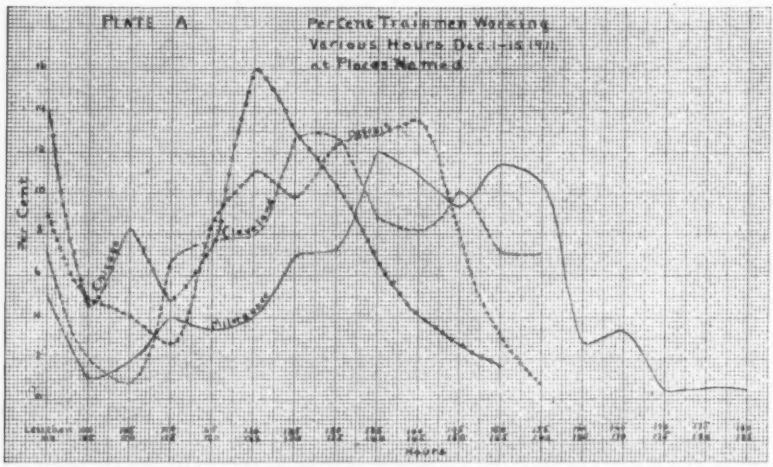
Time in run.	Amount more than average (minutes.)	Men at this time.	Total time.	Worth of this time at 25 cents per hour.
10:25	0.5	13	0.65	$0.27
x	x	x	x	x
x	x	x	x	x
11:20	1.00	2	2.00	0.51
x	x	x	x	x

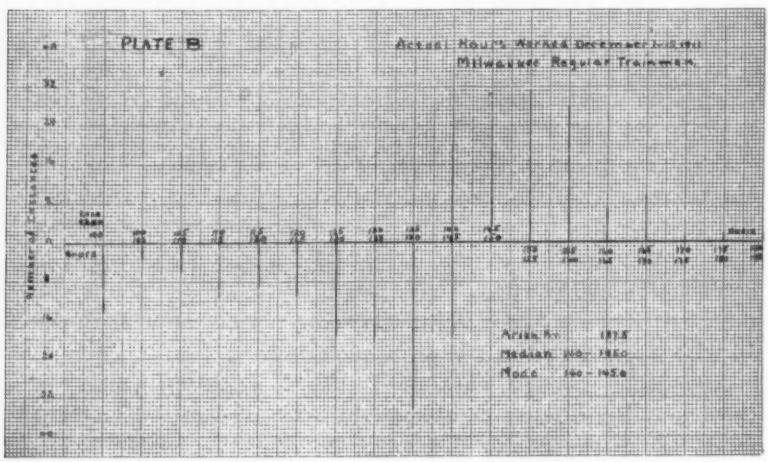
Contrawise, the loss or gain experienced by men who, while working approximately the average length of run, receive a lower or a higher rate of pay than the average man may be expressed in the same manner.

The point which it is desired to emphasize is that the length of duty and the hourly pay of an average man may be wholly acceptable, and still this not be true of any other man who goes to make up this average. Surely it could not be maintained that the condition of the average man at Milwaukee who gets approximately $70.00 per month, and works approximately 10 hours per day for a period on the average of 26 days during the month, describes in any way at all the 9 men who received less than $20.00 per pay, December 1–15, 1911, and the 5 who received between $22–$24 for the same period, as well as the 14 who worked 11 hours or over each day.

Any other average when used alone is subject to many of the same limitations as the arithmetic average. Even the mode which represents that place or condition which is the

most typical, and hence actual, does not describe the condition of those far removed from the typical man. If the data are scattered or widely dispersed, then some other forms of expression are necessary, such for instance as the ones employed in the tables here used to describe the actual earnings, days worked, hours in the pay, hours worked each day, etc. A treatment of each of these subjects with the average as well as actual conditions in mind is necessary.





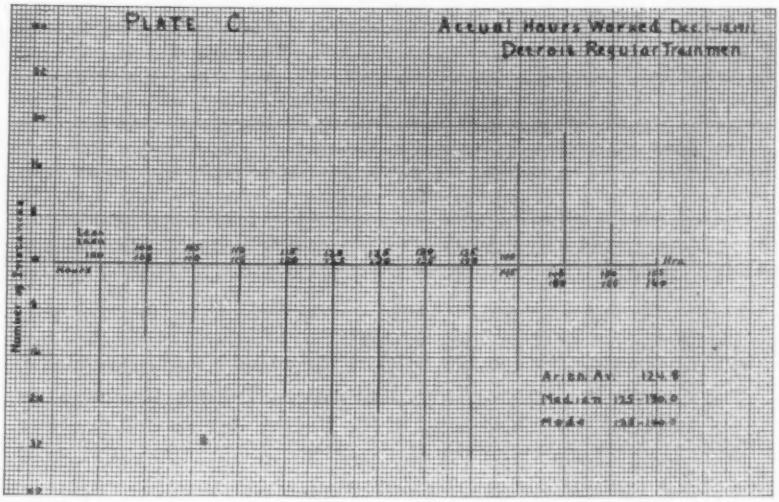


PLATE C
Actual Hours Worked Dec. 1-15, 1911
Detroit Regular Trainmen
Number of Trainmen
Hours
Less than 100
100-105
105-110
110-115
115-120
120-125
125-130
130-135
135-140
140-145
145-150
150-155
155-160
160 and over
Arith. Av. 124.9
Median 125-130.0
Mode 125-130.0

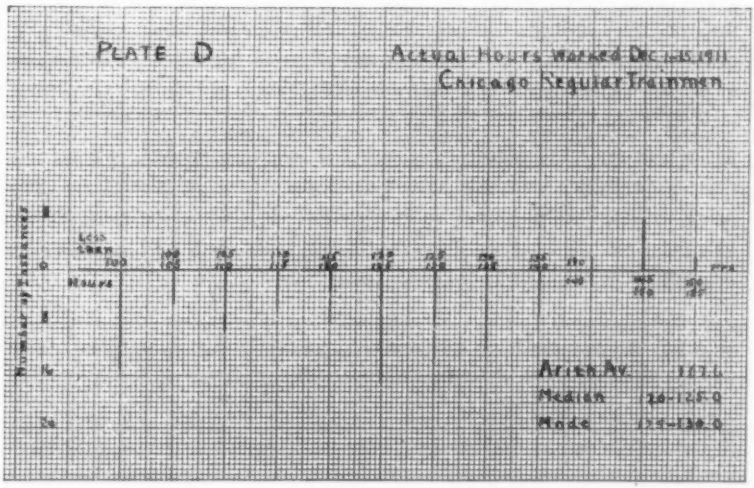
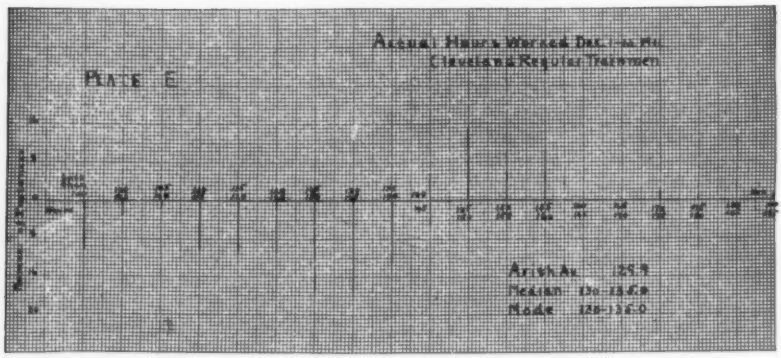


PLATE D
Actual Hours worked Dec. 1-15, 1911
Chicago Regular Trainmen
Number of Trainmen
Hours
Less than 100
100-105
105-110
110-115
115-120
120-125
125-130
130-135
135-140
140-145
145-150
150-155
155-160
160 and over
Arith. Av. 127.6
Median 126-127.0
Mode 129-130.0



The actual as well as the average number of hours worked during the pay, December 1–15 at Milwaukee and other cities, are shown in Plates A–E, inclusive. Taking the men as they worked, i.e., those who worked every day as well as those who were absent part of the period—more Milwaukee men worked 140–145 hours than any other single number of hours, (14.8 per cent. of all). More Cleveland trainmen worked 130–135 hours (12.8 per cent.) than at any other single number of hours; more Detroit trainmen worked 135–140 hours (12.7 per cent.) than at any other single number of hours; and more Chicago trainmen worked 125–130 hours (16.0 per cent.) than at any other single number of hours. This means that the hours put in most commonly by all these trainmen varied from 125–130 hours at Chicago to 140–145 hours at Milwaukee. To leave the matter at this point would be unsatisfactory, because the positions of only about 14 per cent. of the men have been explained. The position of all the men at Milwaukee, Cleveland, Detroit, and Chicago can be described in the following manner:

TABLE II.

SHOWING THE PER CENT. OF ALL REGULAR TRAINMEN AT MILWAUKEE, CLEVELAND, DETROIT, AND CHICAGO, RESPECTIVELY, WHO WORKED DURING THE PERIOD DECEMBER 1–15, 1911, LESS THAN THE SPECIFIED NUMBER OF HOURS.

Per Cent. working less than the hours specified.	Milwaukee.	Cleveland.	Detroit.	Chicago.
120 hours (15 8-hr. days)	15.55	23.65	29.21	39.62
135 hours (15 9-hr. days)	33.70	50.00	62.17	80.20
150 hours (15 10-hr. days)	70.36	77.02	97.00	98.12
Per cent. working more than 150 hours	29.64	22.98	3.00	1.88

These figures are significant, and they tell the story of all the men. Practically *all* of the men at Detroit and Chicago worked during this period *less* than 150 hours; while *more than one fourth* of the Milwaukee men actually worked *longer* than this number of hours. Likewise, the percentage of Milwaukee men who worked less than 120 hours (15, 8-hour days) was only one half as large as the percentage for Detroit and little more than one third as large as the percentage for Chicago.

Now turning to the men who worked every day during the fifteen days, December 1–15, 1911, the following table shows that 42.71 per cent. of those at Milwaukee, worked less than 150 hours (15 10-hour days) while 44.44 per cent. and 89.46 per cent. of those at Cleveland and Detroit, respectively, worked less than 150 hours. None of the men at the two last cities mentioned worked more than 160 hours (15 days of 10 hours 40 minutes) while 18.45 per cent. of those at Milwaukee worked longer than this period.

TABLE III.

SHOWING THE PER CENT. OF REGULAR TRAINMEN FOR MILWAUKEE, CLEVELAND, AND DETROIT, RESPECTIVELY, WORKING EVERY DAY DURING THE PAY DECEMBER 1-15, WHO WORKED LESS THAN THE HOURS SPECIFIED.

Per Cent. working less than the hours specified.	Milwaukee.	Cleveland.	Detroit.
120 hours (15 8-hr. days)	1.94	.....	.....
135 hours (15 9-hr. days)	8.73	.....	10.56
150 hours (15 10-hr. days)	42.71	44.44	89.46
Per Cent. working more than 150 hours	57.29	55.56	10.54

The average number of hours worked at Farwell Avenue and Twelfth Street Stations, Milwaukee, December 1–15, 1911, was 137.5, but this tells us nothing about the men who worked more or less than this period. Likewise, the fact that the average number of hours worked at Chicago is 117.6, is not significant as describing the variety or density of platform periods, but only as drawing attention to the shorter period which the average man works at Chicago when compared with the average man at Milwaukee. The weakness of such an average may be illustrated by a hypothetical example:

TABLE IV.

HOURS IN RUN.

	8	9	10	11	12	13	14	Average.
Number of men at each hour.....	3	3	3	3	3	3	3	11 Hours.
	1	2	3	4	6	3	2	$11\frac{8}{27}$ "
	9	7	1	1	1	1	1	$9\frac{6}{27}$ "
	10	0	0	0	0	0	11	$11\frac{1}{4}$ "

In the first instance, because of the uniform distribution of the men, the average 11 hours is typical, but in no one of the other cases is there an actual occurrence of the average, and in all of them nothing is said about the distribution of the men. The weakness is particularly prominent in the last instance where the men at 8 hours, and 14 hours are not explained at all, and still the men are compactly grouped at well defined runs. One hardly needs to take an assumed instance to show this point. Its significance is readily perceived even from hasty glance at Plates A to E. In Plate A the hours in the pay at the different cities are superimposed upon one another, and bring out the fact that the men work longest at Milwaukee, approximately the same for Cleveland and Detroit and shortest for Chicago. The *distribution* of the hours in the pay for the stations separately is shown in Plates B.C.D.E. where the periods are plotted above and below 140-145 hours, i.e. the equivalent of a semi-monthly pay of $34.34 at Milwaukee, of $36.05 at Milwaukee (Farwell Avenue and 12th Street Stations), of $38.47 at Detroit, of $44.24 at Chicago, and of $41.75 at Cleveland. The number of runs more, less, and at this number is as follows:

TABLE V.

SHOWING THE NUMBER OF HOURS FOR THE PERIOD DECEMBER 1–15, 1911, WORKED BY REGULAR TRAINMEN AT MILWAUKEE, CLEVELAND, DETROIT, AND CHICAGO, WHICH ARE MORE, LESS, AND EQUIVALENT TO 140–145 HOURS.

City.	More.		Less.		At This Amount.	
	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
Milwaukee.....	105	38.9	125	46.3	40	14.8
Cleveland.....	38	25.7	97	65.5	13	8.8
Detroit.....	31	11.6	200	74.9	36	13.5
Chicago.....	10	9.4	92	86.8	4	3.8

Much the same treatment can be given to the average platform duty which according to the schedule in effect December, 1911, was for Milwaukee trainmen at Farwell Avenue and Twelfth Street Stations, 10 hours 19 minutes. The average might have been the same if some of the platform periods had been 8 hours or 18 hours or any other number of hours. One run at 15 hours has as much weight in determining the average as has 5 runs of 9 hours. Such an average as 10 hours 19 minutes is hypothetical only, and does not describe the differences more or less from this average. This is done for Milwaukee and other cities in the following table:

TABLE VI.

SHOWING THE PER CENT. WHICH PLATFORM PERIODS FOR MILWAUKEE, CLEVELAND, DETROIT, AND CHICAGO ARE IN EXCESS OF THE NUMBER OF HOURS SPECIFIED.

Platform Period.	Milwaukee.	Cleveland.	Detroit.	Chicago.
9 hours.....	100.00	83.33	76.32	50.91
10 "	75.16	35.90	36.85	36.35
11 "	9.15	0.00	0.00	1.82
12 "	0.00	0.00	0.00	0.00

These figures mean that while *all* the runs at Milwaukee are over 9 hours, only four fifths of those at Cleveland, three fourths of those at Detroit and one half of those at Chicago are in excess of this period. Twice as large a proportion of the runs at Milwaukee are over 10 hours as those at the other cities.

Neither Detroit nor Cleveland has any runs over 11 hours, while Milwaukee has 9 per cent. and Chicago 2 per cent. in excess of this period. These facts are more completely illustrated by the cumulative curves on Plate A.

On the subject of actual earnings, the following facts are pertinent. The average semi-monthly earnings December 1–15, for both Milwaukee stations are $34.52 for all trainmen; at Chicago they are $34.55; at Detroit $34.21; and at Cleveland $38.95. At Milwaukee more of the trainmen (19 per cent.), however, actually earned between $36 and $38 than any other single amount. This single fact like a statement of average earning, leaves undescribed the number of trainmen earning from less than $20 to those earning $46–$48. The ability of a man to earn $47 in 15 days, and there were three men at Milwaukee who earned between $46 and $48 December 1–15, suggests an excessively long platform day or else high hourly wages. But average hourly wages are comparatively low at Milwaukee. The highest paid man (26 cents per hour) would have to work 12 hours a day for 15 days to earn this amount; while the average man (25.3 cents) would have to work 12 hours and 23 minutes a day for 15 days to earn the same amount. The actual distribution of the men by two-dollar groups is indicated graphically on Plates 1, 2, 3, 4, and 5 following:

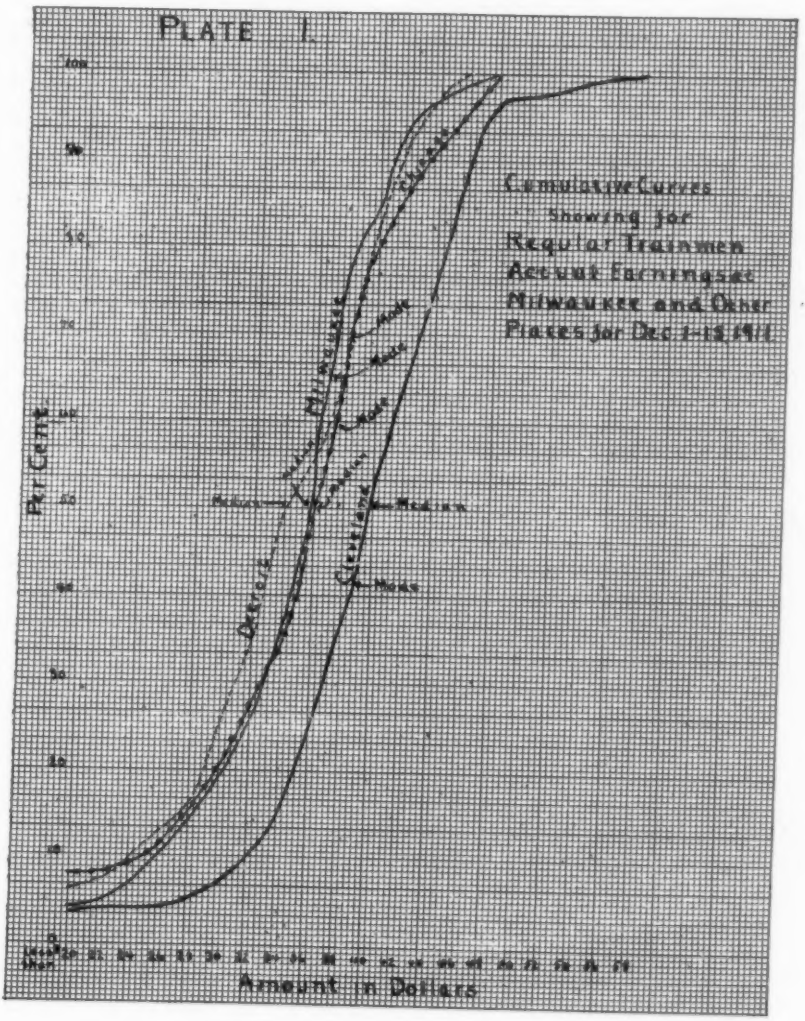


PLATE I.
Cumulative Curves
Showing for
Regular Trainmen
Account Earnings at
Milwaukee and Other
Places for Dec 1-15 1911
Per Cent
Amount in Dollars

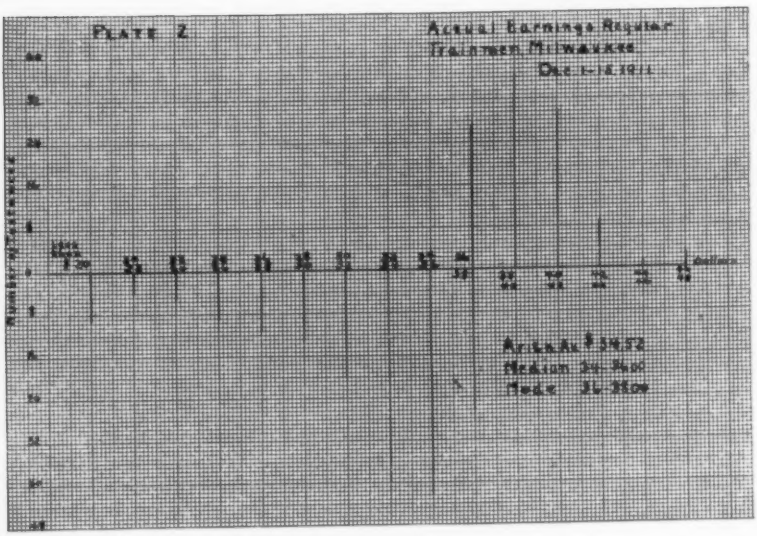


PLATE 2
Actual Earnings Regular Trainmen, Milwaukee.
Dec. 1–15, 1911.
Number of Trainmen
Outliers
Arith. Av. $ 34.52
Median 34.34
Mode 34.38

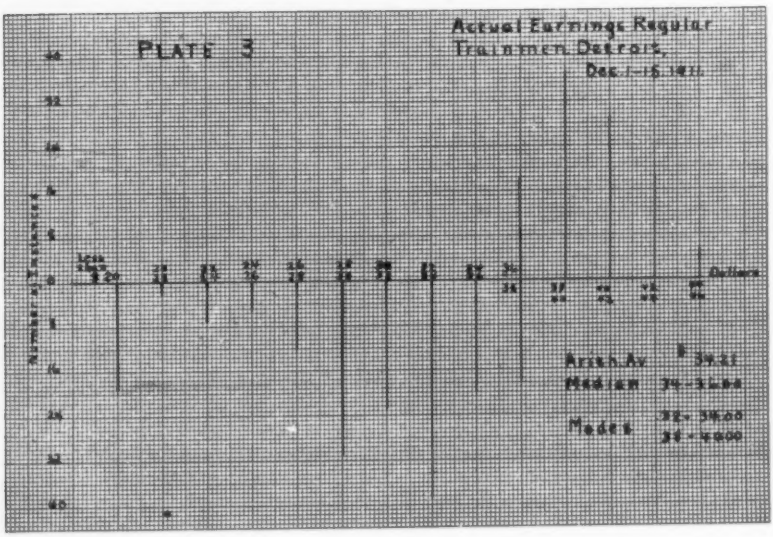
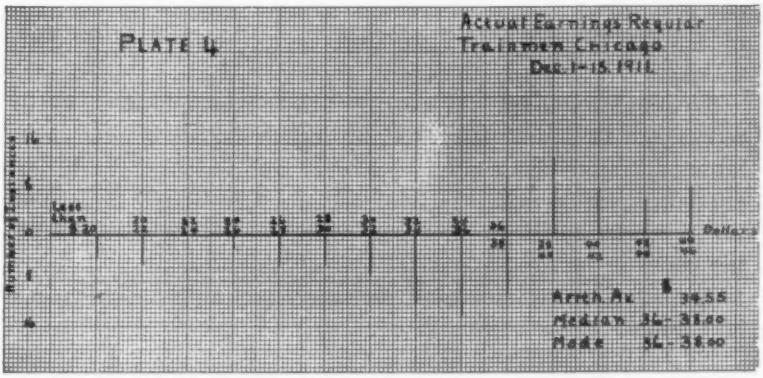
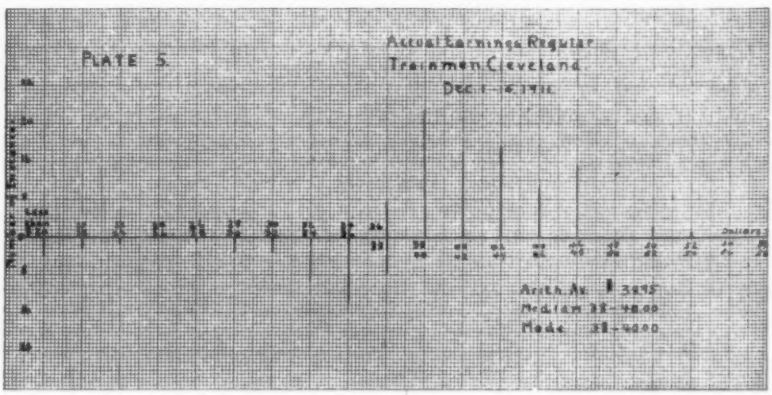


PLATE 3
Actual Earnings Regular Trainmen, Detroit.
Dec. 1–15, 1911.
Number of Trainmen
Outliers
Arith. Av. $ 39.21
Median 34-34.66
Modes 32-32.66
34-34.66





If we compare the distribution of the men at Milwaukee with the distribution at other cities (not being content to express ourselves in averages) the following facts appear:

(a) The percentage of men at Milwaukee, Cleveland, Detroit, and Chicago earning more than $20, December 1–15, is approximately 95 per cent.

(b) The percentage earning more than $36 is 47 for Milwaukee; 75 for Cleveland; 44 for Detroit; and 51 for Chicago.

(c) The percentage earning more than $40 is 15 for Milwaukee; 45 for Cleveland; 18 for Detroit; and 20 for Chicago.

(d) The percentage earning more than $42 is 5 for Milwaukee; 34 for Cleveland; 8 for Detroit; and 13 for Chicago. That is, the percentage for Milwaukee for this amount is about

one seventh of that of Cleveland; a little more than one half of that of Detroit, and little more than one third of that of Chicago.

To get this amount, the average Milwaukee man must work more than 11 hours per day for 15 days. In Milwaukee such labor is possible—indeed 9.15 per cent. of all the platform duties exceeded this period. In Detroit and Cleveland there are no platform duties of this length and in Chicago only 1.82 per cent. of the total exceed 11 hours. Such earnings at these places must be explained by the hourly pay and not by excessive hours.

The actual distribution of the men by earnings is made on Plate I, where the earnings are shown by per cents. receiving less than the given amounts. In Plates 2, 3, 4, and 5 the spread of the earnings is shown by a similar device as that adopted for hours in the pay. The semi-monthly earnings are plotted above and below $36–$38. The number of men receiving more, less and this amount is as follows:

TABLE VII.

SHOWING THE NUMBER OF REGULAR TRAINMEN AT MILWAUKEE, CLEVELAND, DETROIT, AND CHICAGO, RESPECTIVELY, WHO RECEIVE MORE, LESS, AND EQUIVALENT TO $36-38 DURING THE PERIOD DECEMBER 1-15, 1911.

City.	More.		Less.		The Same.	
	Number.	Per Cent.	Number.	Per Cent.	Number.	Per Cent.
Milwaukee.....	79	27.6	153	53.5	54	18.9
Cleveland.....	95	64.2	37	25.0	16	10.8
Detroit.....	89	31.5	158	55.8	36	12.7
Chicago.....	36	32.7	54	49.1	20	18.2

If we eliminate the average man from our considerations and take cognizance of the distribution of *all* of the men at Milwaukee and the other cities treated above as respects platform duty, hours actually worked during a pay, full days off during a pay, and earnings received, the following conclusions are inevitable:

(a) Milwaukee men work approximately 10 hours more per pay than those at Cleveland; 15 hours more than those at Detroit and 15 to 20 hours more than those at Chicago.

(b) The platform duty of all Milwaukee regular men exceeds 9 hours, while one fourth of those at Detroit, approximately one half of those at Chicago, and one sixth of those at Cleveland are less than this amount.

(c) The pay at Milwaukee for all regular men was approximately $2 less per individual per pay (2-weeks period) than that of similar men for a similar period at Chicago and Cleveland and about the same as at Detroit.

(d) The men at Milwaukee are off duty a fewer number of days December 1–15, 1911, than the men at either Cleveland or Detroit. In the 15 days, 67 per cent. of the Milwaukee men had as little time as one day off, while only 50 per cent. of those at Cleveland and only 54 per cent. of those at Detroit had as little time as one day off. The corresponding percentages of those with as few as 2 days off were: for Milwaukee, 80.7 per cent.; for Cleveland, 74.8 per cent.; and for Detroit, 73.1 per cent.

These conclusions mean that Milwaukee men work more hours per day, more hours per pay, more days per pay, and yet receive less money than similar men at these other cities. The explanation of this phenomenon can be found only in the comparatively small hourly pay of these men. Their earnings are small in spite of long hours and continuous service.

STATISTICS AT THE FIFTEENTH INTERNATIONAL CONGRESS ON HYGIENE AND DEMOGRAPHY, HELD AT WASHINGTON, SEPTEMBER 23-28, 1912.

Summary of the Main Addresses before the Division of Demography.

By Walter F. Willcox, *Professor of Economics and Statistics, Cornell University.*

The International Congresses on Hygiene and Demography have always given generous recognition to statistics, more accurately demography or vital statistics. The dual nature of these Congresses as a fusion of two series originally independent is indicated in the name Hygiene and Demography and the division into two great branches, one of hygiene and one of demography. But with the rapid growth and marked subdivision of hygiene, that division is now broken into eight or more sections, while demography can well be accommodated in one. Naturally the bulk of the work of preparation for each Congress is done in the country which is for the time being the host, and the retarded and imperfect development of demography in the United States made the program perhaps less rich and varied than at recent meetings in Europe. The Congress was fortunate, however, in the attendance of Director Evert of the Prussian Statistical Bureau, Director Zahn of the Bavarian Statistical Bureau, Director Würzburger of the Statistical Bureau of Saxony, Director March of the French Statistical Bureau, and Doctor Bertillon, in charge of the municipal statistics of Paris. Unusual pressure of work resulting from the new insurance legislation and the recent census in England made it impracticable for any English demographer to attend. Papers were presented also from Professor von Mayr, President of the recently organized German Statistical Society, Director Sauveur of Belgium, Doctor Bryce of Canada, and Mr. Knibbs, Statistician of Australia.

The Congress was held on the invitation of the Congress of the United States and under the honorary Presidency of President Taft who made a powerful opening address. The American officers of the demographic section, designated by the Department of State, were Walter F. Willcox, President of the American Statistical Association, as president, Dr. John Shaw Billings and Mr. F. L. Hoffman, vice-presidents, and Dr. Cressy L. Wilbur, secretary. Doctor Billings's ill health prevented him from attending. At its opening meeting the section completed its organization by the selection of the following honorary presidents: for Belgium, Director Sauveur; for France, Director March and Doctor Bertillon; for Germany, Director Evert and Director Würzburger; for Great Britain, Doctor Newsholme. After brief opening remarks by the presiding officer, the following telegrams of greeting were sent.

SENATOR LUIGI BODIO,
ROME, ITALY.

Demographers at opening session greet President International Statistical Institute.

WILBUR, *Secretary.*

PROFESSOR GEORG VON MAYR,
MUNICH, GERMANY.

Greetings and best wishes from statisticians gathered at Washington to dean of German statisticians.

WILBUR, *Secretary.*

DR. JOHN SHAW BILLINGS,
NEW YORK.

Greetings and sympathy from opening session to one whose work in demography marks an epoch in the American development of that subject.

WILBUR, *Secretary.*

At a later session a telegram of reply was received from Professor von Mayr as follows:

WILBUR, CENSUS BUREAU,
WASHINGTON, D. C.

Statistical colleagues hearty thanks greetings.

MAYR.

The opening session was devoted to a symposium on the development of vital statistics in the United States since 1900. Doctor Wilbur began, calling attention to the rapid growth of the area in which deaths are registered and the connection of this extension with the adoption of the model law recommended by Congress for the registration of deaths. This law provides for local registrars each with a well-defined district and for no burial without a permit which presupposes the filing of a death certificate. It involves also monthly returns of the original certificates to the state registrar. The main need is for the extension of this model law to new states. The incompleteness of the birth registration in the United States is due to inefficient enforcement of law and not to lack of law. Here the main need is to secure fearless, impartial, and rigorous enforcement of the law requiring the registration of births. "Pennsylvania is today the only state in which a registration law for births has been thoroughly enforced on a state-wide basis."

Doctor Batt said that the Pennsylvania registration law of 1905 had been prepared in consultation with the Census Bureau and that its success had led to its general acceptance as a model law. The local registrars are appointed and dismissed and the law itself enforced by the state office. The accuracy and completeness of local registration may be tested in various ways culminating in dismissal and even prosecution of the registrars.

In Missouri, as in Pennsylvania, Doctor Hiller said, the State Board of Health appoints the local registrars. Nearly five sixths of them are physicians. There are about nine registrars to every ten townships in the state.

Doctor Plecker described the new law in Virginia. It provides that local justices of the peace, some 1400 in number, shall act as registrars. To distribute these to the area was a difficult task. The publicity work of the State Board of Health was devoted for three months mainly to vital statistics. A bulletin, "Why Births and Deaths are to be recorded in Virginia," was widely distributed.

Conditions in Louisiana were sketched by Doctor Dowling. The model law was passed by the State Legislature in 1912, but

records are not yet received from more than one third of the state. The Superior Court has ruled that the State Board of Health has authority to enforce the registration of births and deaths and the appropriation for the board, though very meager, has been increased.

In New York the registration of deaths is now practically complete but perhaps 10 per cent. of the births go unregistered.

Doctor Bertillon presented a paper on the classification of causes of death. In opening he reviewed the history of this movement since 1853, when, as a result of the work of the first International Statistical Congress in that year, two classifications were made, one by Farr based upon the location of the disease in the human body and the other based upon the nature of the disease. The latter is now entirely obsolete; the former, so far as Farr carried out his principle, is still serviceable. Statistics require classifications permanent enough to secure comparable records for a long period of years and this Doctor Farr's classification gave. In 1891 the International Statistical Institute asked Doctor Bertillon to prepare a new classification. He followed Farr's principle of classifying according to the location of the disease and sought also to make his results comparable with those of the chief nomenclatures then in use. His results were reported at the Chicago meeting of the International Statistical Institute in 1893. Since that date the system then submitted and approved has been gaining ground, until now it is used in all the Americas and in all other countries outside Europe which compile statistics of the causes of death. In all of western Europe, except Germany, and in some countries or districts of eastern Europe it has also been introduced. It is revised every ten years by an international commission which has already met twice.

Director Würzburger of Dresden, in discussing Doctor Bertillon's paper, explained the failure of Germany to adopt it by the fact that they had long possessed national statistics of the causes of death which they felt bound to retain. He pointed out also that the differences between the German system and the Bertillon system were of little importance and related mainly to deaths of children under one year, deaths which it is

difficult at best to tabulate by cause, because a large proportion of them are reported without any medical certification.

Doctor Falkner of the Census Bureau, after describing the development of demographic work in the Federal Census, said that the published results of the census of 1910 will distinguish sharply between geographical analysis and subject analysis. Two volumes will be devoted to the former, the units of area being 2,955 counties and 229 cities of at least 25,000 inhabitants. Less information will be given for wards in cities of at least 50,000 inhabitants and for cities of 2,500 to 25,000 inhabitants. In these two volumes the facts regarding a given unit of area will be brought together in one column. In the analysis by subject a given characteristic is traced in its distribution through the states and large cities. The Abstract will be issued in 52 editions, one for each state, these editions having one part in common and one part giving specific and detailed information for the state in question.

The training of demographers and the facilities for that training in Germany were interestingly described by Director Würzburger and French conditions, by Director March. The feeble and tardy development of demography in the United States was ascribed by Professor Willcox to the sparseness of population, the lack of any central authority or common model, the slight and variable value of the published data, and the small number of competent interpreters. All but the last of these reasons are rapidly losing their force. The best place to train competent demographers is in a public statistical office, but universities may do part of the work. More books and articles on American demography also are needed.

The development in the United States of mechanical methods of tabulating demographic data, mainly through the inventive genius of Doctor Hollerith, was traced by Mr. H. T. Newcomb and the incalculable gain to modern census and registration statistics resulting from these devices convincingly shown.

Director Durand of the Census Bureau described briefly the mechanical devices now employed in tabulating the returns of the thirteenth census of the United States and many of the recent important improvements. He then proceeded to

examine the conditions under which such mechanical tabulation would prove advantageous. He classified the conditions under three heads, where the data are intermingled in the original schedules, where they must be combined according to two or more classifications, and where greater detail is needed for large areas than for small. All these conditions concur in the population census.

The themes for Wednesday morning's session were municipal vital statistics and infantile mortality. Director Würzburger said that the most remarkable feature of German municipal vital statistics was not the standard uniform tables but the exceptional special tables published by certain cities. This is due to decentralized organization. Each state sends uniform tables to the Imperial Statistical Office, but gets much more detailed information for itself, the character and amount of which vary from state to state. Certain large cities, also, are authorized by the state to get for their own purposes still more information. This diversity of data is supplemented by wide differences in the number and form of the tabulations. A mere list giving the titles of the various tables published by German cities covers fifty printed pages.

A paper by M. Sauveur, Director-General of the statistics of Belgium, described Belgian vital statistics. The unusual feature is the maintenance of a current register of population in each of 2,600 communes. This is a list of all residents of the commune with various statistical items about each. Every new resident in the commune must enroll on this register, and every resident leaving the commune must give notification and obtain a certificate of change of residence before he departs. Any one who changes his place of residence within the commune must report that fact to the registration official within eight days. From these registers the population of each commune each year and also the annual immigration and emigration from each commune are determined.

Mr. Hoffman, speaking on the present condition of American municipal statistics, took the ground that the establishment of a division of vital statistics in the permanent Census Bureau had influenced certain local boards of health to shirk their own responsibilities and perhaps in this way had checked

the development of municipal vital statistics. But the original data are now more uniform and more accurate. He was critical of the long delays in publication, the lack of uniformity, the crude analyses, the neglect of the influence of age and race, the excessive attention to classifications by month of death, which is usually a minor factor, the failure to distribute deaths in institutions, and to study the mortality of small urban areas. He urged the local study of mortality by occupations, age, and cause by the proportionate method, i.e., taking total deaths in a given occupation and at a given age as 100 per cent. and finding the proportion due to the several causes. He strongly favored introducing the Budapest system of classifying deaths ascribed to more than one cause.

Mr. Phelps, speaking on infantile mortality, described its recent decrease in most European countries and the fall in the actual number of deaths under one year of age in certain American cities and states having most accurate registration of deaths. He then examined the causes to which the fall might be due.

Doctor Davis discussed the comparative mortality of breast-fed and bottle-fed infants with special reference to the results of an *enquête* in Boston. This indicated that about two thirds of all children under one year of age were breast-fed, the proportion varying between 51 per cent., where the mother was a Canadian, and 83 per cent., where the mother was an Italian. It indicated also that the mortality of bottle-fed babies was about six times as great as that of breast-fed babies. He concluded that if all children had been breast-fed, nearly 1,000 infant lives would have been saved annually in Boston and the infant death rate would have been 71 instead of 127 per 1,000.

Doctor Guilfoy presented an analysis of infantile mortality in New York City. The statistics are still incomplete, as he seemed disposed to admit that 5 per cent. of the births escaped registration. But the city's rate as thus estimated compares favorably with urban rates in Europe. For historical purposes he compared the deaths under one with children living under one, and showed the decline of infant mortality in twenty years and some of the factors influencing it.

Thursday morning's session opened with a paper on divorce statistics from Doctor Dike, the veteran pioneer in the effort to get a sound statistical basis for a study of the divorce problem in the United States. He urged that American states and foreign countries should publish divorce statistics at frequent intervals or, if possible, annually; that the scope of the published data should be increased; and that an intensive study of individual cases should be made by special agents, aiming to get at the real causes underlying the legal pleas.

Doctor Hill followed with a paper on the present position of marriage statistics in the United States. In every state but South Carolina some local record must be made of every marriage. In many states this is unpublished and is the only record; in some, the locality reports to a state office which publishes no data; some states publish nothing but the total number of marriages each year; while a few give adequate statistical tables. Doctor Hill urged that the time has come for the preparation and publication by the United States of an annual report upon marriage statistics.

Professor Field urged that demography should turn from a mere quantitative study of the number of people to include and to emphasize the statistical analysis of various classes distinguished qualitatively one from another, and the correlation between ancestry and descendants.

Doctor Southard read a paper on the "Geographical Distribution of Insanity in Massachusetts." He showed that more insane persons were committed per 10,000 population from the cities of Massachusetts than from the towns. Taking the rate of first commitments from the whole state 1901–1910 as 100 per cent., that from the cities as a class was 109 and that from the towns as a class was 80. But the several cities differ among themselves much less than the towns, the lowest city rate being 3.5 and the highest 9.8 per 10,000, while the towns range from zero, in 12 cases, to 16.4. This suggests the existence of certain rural foci of insanity and further study of other types of deterioration in their geographical distribution.

Perhaps no paper presented before the section was of greater importance than the one on family statistics by M.

Lucien March, Director of the Statistique Générale de la France. He had presented a report on the same subject at the preceding session of the Congress in Berlin. Since that date France had published the results of special studies in this field and M. March's paper was a survey of their main results. To 100 French families of all classes the number of children living and dead was 293, of whom 219 were living at the census day, or a little more than two children to a family. The smallest proportion of sterile marriages, less than 5 per cent., was where the husband was 40 to 49 years old and had been married more than 25 years. Among families of this class whose heads were in some specified occupations sterility fell to 3 per cent., which is perhaps the physiological minimum. Classifying families by the occupation of the head, the fertility of laborers was greatest and of salaried employees, least. Fishermen and sailors had the greatest fertility. An intellectual occupation entails late marriage and few children. Work in a small establishment has a similar effect. Place of residence also has a traceable influence on fertility.

A special study into the relation between fertility and economic position as measured by wages or salary was made for the employees of the state, the departments, and the communes. The number of children in laborers' families diminishes as income increases; in families of salaried employees it diminishes to a minimum where the annual income is from $500 to $2,000 and then rises.

In studying infantile mortality by sequence of child in the family, it appears that the death rate of first born is less than that of later born children. This may be explained on physiological grounds, children in small families inheriting more vigorous constitutions; or on psychological grounds, parents with forethought and self-control enough to adjust the size of their families to their economic position also giving more care and protection to such as they have.

Professor von Mayr sent a paper on "The General Problems of Criminal Statistics," a topic to which he has given attention in the latest parts of his monumental *Statistik und Gesellschaftslehre.* He urged that the field of criminal statistics should be conceived much more broadly than has usually

been the fashion. Thus it should include all statistics of minor offenses dealt with by the police, statistics of preliminary or interlocutory as well as of final decisions, statistics of offenses and of offenders, statistics of sentences, of prisoners, and of pardons. No one or two branches should be accepted as an adequate substitute for a development of the entire subject. He urged that the data should be recorded on registers or, better yet, on individual cards and tabulated at a central office. He concluded by proposing that a model set of cards available for international use should be prepared and coöperating committees of this Congress and of the International Statistical Institute be established to consider the international nomenclature and scientific classification of offenses.

Mr. John Koren, who has had charge of the Federal inquiries into criminal statistics, followed with a paper describing "The Condition of Criminal Statistics in the United States." He classified the purposes of criminal statistics as: (1) measuring the volume of crime; (2) presenting the facts regarding the various classes of crimes and criminals; (3) showing the judicial methods of dealing with crime; (4) affording a basis for special intensive studies. The United States has no criminal statistics in the broad sense of that term. The municipalities and states have almost no genuine police statistics. Even the number of homicides is obtained only from a compilation of newspaper clippings. Statistics of the criminal courts are equally lacking. The report of the Federal Census Bureau on prisoners is almost our only basis of information. But even an ideal report on prisoners would give no satisfactory picture of criminal statistics. Thousands of criminals are unconvicted and other thousands escape with a fine. Each state has its own code and judicial system. One uses fines freely; another, sparingly. The extending use of probation, parole, the suspended sentence, especially for juvenile delinquents, is making prison statistics less significant. No state has a good system of prison statistics, largely because in no state are all prisons under central control. The main basis of criminal statistics should be the records of the criminal courts, and neither the Federal gov-

ernment nor a single state gathers such statistics in serviceable fashion. In this field the Federal government has no authority over the states and the only possible basis for developing adequate statistics is by a system of voluntary coöperation like that under which Federal work in vital statistics is progressing. Still the very number of criminal courts (*e.g.*, more than 1,300 in Texas, about 1,000 in Ohio) makes it almost impossible to secure a report from each one to Washington either directly or through the state capital. Nor would it be feasible to limit the inquiry to certain classes of crimes or of courts. The definitions of similar crimes and the jurisdiction of similar courts differ widely from one state to another. Then, too, court records are often meager and statistically most inadequate. Still it is probable that the Federal government will continue and extend its efforts and it may gradually improve state and local records and get authority to collect and publish such statistics as are obtainable. But the ultimate relief must be found in intelligent state action, organizing an efficient bureau for compiling its criminal statistics.

Director Zahn, of the Bavarian Statistical Bureau, presented an extremely important paper on the "Relations between Workingmen's Insurance and Poor Relief in Germany." The relations between workingmen's insurance and poor relief are manifold, sometimes of coincidence, sometimes of sequence, sometimes of opposition, sometimes of complete independence. The most important relation, no doubt, is the unloading of poor relief upon the insurance funds. This appears clearly from comparing the amounts spent for insurance and for poor relief. The relation of social insurance to poor relief is like that of public hygiene to medicine. Insurance has diminished the amount of pauperism to be alleviated by poor relief. This unloading process will become more obvious as the present generation of paupers is gradually displaced by a succeeding generation which has accumulated its insurance. The advantages will be moral as well as material, training the people to saving, self-control, and prudence. The officials administering poor relief foster the relations between insurance and poor relief, explaining to those in need the provisions regarding insurance and discouraging

application to themselves. Some officials even pay insurance premiums on behalf of those who cannot do it for themselves and thus keep the policies alive. The money thus saved by these officials can then be applied in other directions.

Nevertheless for quite other reasons the cost of poor relief is increasing and will continue to increase. But without the system of insurance that increase would have been more rapid. While the cost of poor relief proper has decreased, the cost of social hygiene has increased. This is not strictly poor relief, but a kind of expenditure intermediate between insurance relief and poor relief. The three resemble a series of concentric circles. The innermost circle, that of poor relief for such as cannot subsist by their own resources, is decreasing in area; the other circles are increasing. As Schäffle wrote in 1881: "The ultimate goal of the statesman is not wealth and ability for a few, but the greatest physical, economic and moral strength of all. Whatever assures the masses and makes them content, strengthening them by coöperative action, securing industrial peace and preventing upheavals, whatever leads us on from the idea of pauperism and beggary to a consciousness of solidarity in caring for others, whatever protects countless persons from premature decay, whatever raises the moral and political level of the lower classes in the eyes of a statesman is of measureless value for securing the greatest social efficiency. But this requires compulsory insurance of the individual against wretchedness and want.".

With reference to pauperism German workingmen's insurance leads the wage earners to realize that they are caring for their own future with the state as a partner. Through a social transformation of poor relief it engenders the greatest amount of social power and raises the economic level of the German nation.

Other papers by M. M. Dawson on "Progress Towards the Construction of Life Tables for the Population of the United States," by Herbert D. Brown on pensioning members of the civil service, by Mr. Knibbs, Statistician of Australia, on norms for population and for death rates, in the absence of their authors, were read by title.

Three evenings were given up to special addresses by distinguished foreigners, one from England, one from France and one from Germany. Of these three, two were devoted to demography. Doctor Bertillon presented further results of his studies upon occupational mortality with especial reference to the causes of death prevalent in the various occupations. Director Zahn spoke vigorously and convincingly in defense of Germany's workingmen's insurance legislation and of its effects upon the population of that nation.

The following resolutions were passed by the section and, after its recommendation and the approval of the Permanent International Commission, were adopted by the Congress itself at the closing session:

I.

The Congress desires that in every country the statistics of births, deaths, marriages, and divorces may be published periodically and if practicable annually.

II.

1. The Congress believes that countries, states, or large cities which publish demographic statistics need registrars or similar officers sufficiently trained in medicine and demography and able properly to interpret demographic statistics, especially those of the causes of death.

2. The Congress believes that provision for the training and opportunity for the appointment and retention of such men are of fundamental importance in public health work.

III.

1. The Congress desires that family statistics, including those of children born and children living, be gathered periodically in connection with the census.

2. The Congress desires that in connection with the registration of births information be gathered showing the order of this birth in the family.

3. The Congress desires that in connection with the registration of deaths of married, widowed, or divorced persons information be gathered regarding the children, if any, of the decedent.

IV.

1. The Congress desires that in every country criminal statistics may be published periodically and if possible annually.

2. The Congress desires that a commission be appointed to report upon the subject of uniformity in criminal statistics, expecially a uniform nomenclature.

3. The Congress desires that the International Statistical Institute at its meeting at Vienna in 1913 be invited to coöperate in the examination of this subject.

V.

The Congress urges the demographers of the several countries to pay special attention to the influence of occupation upon mortality.

Of the social functions, only one was of peculiar interest to members of this Association. On Tuesday, the second day of the Congress, a pleasant luncheon in honor of the foreign statisticians and invited guests was given at the Raleigh Hotel by the Washington members of the American Statistical Association.

The crowded state of the program made it impossible to have any exercises beyond a few words from the presiding officer, representing the Association and welcoming the foreign guests, and a few words of reply from Dr. Jacques Bertillon, whose grandfather coined the word *demography*, whose father was the president of the first International Demographic Congress, who himself had attended eleven of the twelve Congresses and who thus represented in his own person the line of traditions linking this Congress with its predecessors.

One who had attended the International Congress on Tuberculosis at Washington in 1908 could not but be struck with the great progress which our national capital has made in four years towards becoming a satisfactory headquarters for a great scientific congress. Instead of meeting in an unfinished building and in close juxtaposition to the Exhibition, where the scientific sessions were disturbed by the pounding of hammers and the noise of those inspecting the Exhibition on

the other side of cheese cloth partitions, a separate building had been secured for the Exhibition, the various sections were housed comfortably and with dignity, the public exercises were impressive, and, barring at the start a certain confusion and disorder almost inseparable from a congress of this sort, the arrangements as a whole left little to be desired. It was unfortunate that no arrangements were made for translating and printing the scientific papers in advance of the session and thus securing the greatest advantage of such a congress, by making it a forum for the interchange of opinion between experts rather than for the reading of papers. Perhaps in this respect future American congresses will improve upon this one. The unfamiliarity of most American statisticians with the conversational use of any other language than English is a further and serious drawback to the success of such a congress when held in this country.

It is much to be hoped that a decided incentive to more rapid development of American demography will result from the present Congress and that perhaps a score of years hence, when the next International Statistical Congress shall meet in the United States, the country will be able to make a fairer showing of its work in this field. Certainly that will be true if the progress of the last ten years shall continue at the same rate during the generation to come.

REVIEWS AND NOTES.

Infantile Mortality. Report of the Special Committee appointed by the Council of the Royal Statistical Society to enquire into the systems adopted in different countries for the registration of births (including stillbirths) and deaths with reference to infantile mortality.

The sixty-one-page report recently issued by the Royal Statistical Society under this title is a notable accession to the statistical bibliography of infant mortality, incidentally visualizes certain basic defects in international comparisons of vital statistics, and will materially aid in clarifying the jumble of registration practices and statistical methods with which it deals. Its sub-title indicates the broad scope of the investigation bearing the authoritative seal of the Royal Statistical Society, and the collation, tabulation, and publication of returns from no less than one hundred three registration and statistical officials in all parts of the world, under such auspices, not only emphasize the pressing need for international agreement on at least fundamental points in the registration of births and deaths, but give definite form and substance to that well-known need.

The civilized world at large is just beginning to awake to the far-reaching importance of the infant mortality problem. It is universally conceded that one of the prerequisites for intelligent action calculated to effect the desired diminution of infant mortality is the compilation and widespread circulation of authoritative statistics of infant mortality. To be effective, these statistics must be fairly comparable, the fact being, as so well stated by Professor Jevons in one of his lectures before the (Royal) Statistical Society, that "there is little or no significance in any statistical number, except as compared with some other similar number." As yet, owing to the wide divergence of the lines on which births (living births and stillbirths) and infant deaths (including, or not including stillbirths) are registered in the various countries, and the varying percentages of births actually registered (especially in the United States), in the field of infant mortality statistics the "other similar number" which Professor Jevons demanded is missing in many, if not most cases. Really comparable international statistics of this order will not be available until the present wide margin of error, particularly in the registration of stillbirths, has been materially reduced.

The form of inquiry addressed by the Royal Statistical Society's Special Committee to one hundred thirty-six registration officials, including practically all civilized sections of the world, contained sixteen questions, beginning with those essentials: "is the registration of births compulsory?" and "is the registration of deaths compulsory?" and their natural complements as to how soon after the occurrence the registration must be effected in each case, and the penalty in each case for non-registration.

Next in order was the highly important question, "do many births or deaths escape registration?" and in every one of the eleven other questions some inquiry regarding stillbirths is to be noted, thus sharply accentuating the vital importance to the compilation of the statistics of infant mortality of the registration methods in the matter of still-births.

The answers to the sixteen questions propounded are effectively grouped in five tables, each of which is supplemented with a mass of explanatory footnotes, and it appears that in every foreign country from which returns were received, with the single exception of Finland, the registration of births and deaths is compulsory. In England and Wales, prior to the adoption of the present Notification of Births Act, births might be registered at any time within six weeks, but in those sections in which the new Act is in force registration of births must now be made within thirty-six hours. According to the Special Committee's tabulation of the requirements, in Nebraska births must be registered within twenty-four hours, and in Indiana and New York within thirty-six hours; but with these exceptions no country or state insists on registration inside of the two days fixed by Newfoundland, or the three days allowed by Belgium, France, Holland, Luxemburg, Roumania, Spain, Switzerland, Egypt, Argentina, and North Dakota. The time allotted for the registration of deaths of course is generally much shorter, in most cases being within twenty-four hours, or "before burial."

In the tabulation of responses to the question, "do many births or deaths escape registration?" a great variety of statements are to be found, ranging all the way from "no" to "yes," and including such problematical answers as "only a small percentage," "a considerable number of births," "only exceptionally" and "not many." There would seem to be at least two serious defects in this tabulation; first, in the ambiguity of any single answer to the dual question, and secondly, in the meaningless character and dubious relative importance of such answers as "only very few." The registration of births is notoriously incomplete in most states and cities of the United States—even in many of those within the Registration Area —and in the responses to the inquiry Connecticut admitted that "about 10 per cent." of births within her borders were not registered, Maine from 10 to 15 per cent., Maryland 40 per cent., New Jersey "0–20 per cent.," New York 10 per cent., North Dakota 25 per cent., Ohio 20 per cent.,, and Texas 45 per cent. North Carolina's sweeping answer to the dual question, "we think not," is decidedly mystifying, that state having no law whatever for the registration of births, and the registration requirements as to deaths applying only in municipalities of five hundred and over. It is doubtless entirely safe to assume that practically all of the answers from states in the United States in response to this dual question are in the nature of underestimates, and even the most hasty glance down the list of these self-interested answers at once makes apparent the mandatory reasons for the omission of United States figures from all the international comparisons of vital statistics worthy of the name.

The complications and discrepancies in the returns multiply when the

tabulations of data regarding stillbirths are reached. In no less than seventeen of the thirty-three divisions of the British Empire listed, the registration of stillbirths is *not* compulsory; Denmark, Finland, and Spain are the only other foreign countries in which this condition of affairs is noted, but it is charged up to both New Mexico and North Carolina. In ten of the thirty-three divisions of the British Empire stillbirths are apparently recorded in separate registers and are thus listed in Bosnia and Herzegovina, Holland, Norway, Spain, Japan ,Costa Rica, and Cuba. Returns on this score from twenty-six states of this country are presented, and twelve of these twenty-six are credited with maintaining separate registers for stillbirths. In twenty-nine of the ninety-three countries and states included in the tabulation, a stillbirth is registered under both births and deaths. Only in a very few, unimportant cases is any definition of "stillbirth," or "stillborn," prescribed by law, and Norway, Indiana, and Cuba alone are named as sections in which there has been any judicial decision bearing on this point, although in France according to a decision of the Court of Besançon in 1844 it would appear that the registration of a stillbirth is held by French jurisprudence to "include, not only children who have been the full term in the womb, but all such as are born sufficiently formed for it to be possible to declare the sex."

The final table in the Special Committee's report, and the most important in its direct bearing on infant mortality statistics, is that dealing with these questions and the answers received:

(1) In the compilation of statistics, are stillbirths entered among (a) births, (b) deaths, (c) both, or (d) separately?

(2) Is the infantile mortality calculated upon births or upon estimated population (0–1)?

As the returns show, in England and Wales, Ireland, Scotland, Gibraltar, Ceylon, Cyprus, Hongkong, Natal, Sierra Leone, Jamaica, New Brunswick, New South Wales, New Zealand, Queensland, South Australia, Tasmania, and Hungary stillbirths do not enter into the vital statistics of the countries in question; but in Alberta, British Guiana, Austria, Bulgaria, France, Saxe-Meiningen, Saxony, and Sweden are entered among births, and in Belgium, Hamburg, Saxe Coburg-Gotha, and Uruguay are entered among deaths. In all of the other foreign countries from which returns were received stillbirths are included among both births and deaths or separately recorded. Mauritius, Anhalt, Saxe-Meiningen, Spain, Cuba, and Uruguay calculated their infant mortality on the basis of estimated populations under one year, as do quite a number of states of this country with seriously defective birth registration, but in all other cases the calculation is made on the basis of births, the vast majority of foreign countries using the number of births registered, instead of the number of births occurring.

In addition to the tabulations above summarized, the report presents much interesting information in the form of a brief History of Registration, and a discussion of the Practice of Registration, Stillbirths, and Statistical Methods, and concludes with these recommendations:

(1) That stillbirths should be tabulated separately, such tabulation to include, *if necessary*,

(a) the number of children born alive but registered as dead, and

(b) the numbers born in each successive week or month after the prescribed (earliest) time for registerable stillbirths;

(2) That for general use the infantile mortality rate should be calculated from

(a) the births of children born alive, including, *if necessary*, those born alive but registered dead, and

(b) the number of deaths of children born alive during the first first year of life, including, if necessary, the children "presented dead."

The collation and coördination of the most authoritative and up-to-date data on the lines briefly summarized herewith can only be regarded as a service of real value to the cause of sound vital statistics, and in no other book or brochure of which the writer is aware is a tithe of this mass of information to be had. Obviously, in the case of some states of this country, and presumably in the instance of some foreign countries, a few inaccuracies have crept into the returns, probably due to the misinterpretation of the questions or careless framing of the answers by the registration officials, but in the main the report partakes of the character of an official international compilation, and, as stated on a previous page of this review, not only emphasizes the pressing need for international agreement on at least certain fundamental points in the registration of births and deaths, but gives definite form and substance to that well-known need. Several of the desiderata discussed by the Special Committee have been considered by American registration officials and the American Public Health Association for many years, and at the recent meeting of the Association in Washington it was decided to undertake even more precise definitions of births and stillbirths than those already included in its rulings, and also to fix the minimum limit of uterogestation below which stillbirths need not be recorded, and a special committee was named for that purpose. In a general way the American Public Health Association and the Special Committee of the Royal Statistical Society are in substantial accord on the more important points discussed by them, and this agreement of the leading American and British statistical authorities lends great weight to their conclusions. The Special Committee of the Royal Society had an exceptionally strong personnel, consisting of Reginald Dudfield, chairman; William Cospatrick Dunbar, Shirley F. Murphy, C. P. Sanger, and T. H. C. Stevenson.

EDWARD BUNNELL PHELPS.

A COMPARATIVE STUDY OF RAILWAY WAGES AND THE COST OF LIVING IN THE UNITED STATES, THE UNITED KINGDOM, AND THE PRINCIPAL COUNTRIES OF CONTINENTAL EUROPE.

PUBLISHED BY THE BUREAU OF RAILWAY ECONOMICS (BULLETIN No. 34), JUNE, 1912.

The summary of this valuable study is sufficiently interesting to warrant its reproduction in full:

"Information is not obtainable upon which can be based a comprehensive statement of railway wages being paid at this time in the different countries. Therefore, it is necessary to make comparisons for the latest year for which comparable data are available.

"The average daily compensation of railway employees of all classes for the year 1910 was in the United States, $2.23; in the United Kingdom, $1.05; excluding supplementary allowances negligibly affecting the average, it was in Prussia-Hesse 81 cents, and in Austria 89 cents. The lowest paid railway employee in the United States, the ordinary trackman, receives a greater compensation than many of the railway employees of France, even those of higher grades and with responsible duties. The compensation of railway employees is from two to three times as high in the United States as in Italy.

"A recent report of the Board of Trade on railway wages shows that the average weekly pay of enginemen in the United Kingdom in 1907 was $11.17; of firemen, $6.67. In the same year enginemen on American railways received an average weekly compensation of $25.80, counting six days to the week, and firemen $15.24. Recent returns make it clear that in 1912 enginemen and firemen in the United States are compensated at rates of pay for specific runs that are two, three, and four times as high as the corresponding rates on representative English railways. The annual compensation of enginemen in the United States, as reported by two representative railway companies, now ranges from $1,100 in switching service to over $2,800 in passenger service, and of firemen from $700 in switching service to over $1,700 in passenger service.

"For Continental Europe official returns in requisite detail are not available for a later year than 1908. The salaries and allowances of the typical engineman in Germany amounted for that year to $646.88, in Austria to $870.80; of a fireman in Germany to $424.59, in Austria to $532.03. The annual compensation of enginemen on two of the principal railways of France ranged in 1908 from $505.66 to $906.91, and of firemen from $324.24 to $595.98. In Italy, enginemen received in 1908, salary and allowances included, from $581.10 to $812.70 a year; firemen, from $330.30 to $475.05

a year. In these Continental countries the maximum compensation is received only after many years of service.

"The average annual compensation of enginemen in the United States in 1908, on an estimated basis of 300 days' service, was $1,335; of firemen, $792. In this country the rate of compensation of these employees does not depend upon length of service.

"In Belgium enginemen received in 1907 from $23.16 to $39.60 a month; firemen, from $17.37 to $23.16 a month; conductors and station employees, from 46 cents to 96 cents a day. In the United States, in the same year 1907, enginemen averaged, on the basis of 25 days' service, $107.50 a month; firemen, $63.50 a month; conductors $3.69 a day; station employees, from $1.78 to $2.05 a day.

"An accurate wage comparison must take into account relative cost of living, and this has been done, so far as ascertainable data permits.

"The rental of a three- or four-room house or flat is almost as high in Berlin, Paris, or London as throughout the United States, but in England and on the Continent it generally runs from thirty dollars to ninety dollars a year less. The quantity of food and fuel estimated by the Board of Trade of England as the standard consumption of a typical workingman's family costs in the United States 17.8 per cent. more than in France or in Germany; 35.3 per cent. more than in Belgium, and 38 per cent. more than in the United Kingdom.

"It is well within the truth to estimate in a broad and general way that while the cost of living of a railway employee in the United States is less than 50 per cent. higher than that of a corresponding employee in the United Kingdom or on the Continent, his compensation averages over twice as great.

CENSUS OF CANADA, 1911.

Of this census, which is the fifth that has been taken, the first volume is now ready. It deals with area and population and consists of two tables. The first shows the area of the sub-districts, the population classed as male and female, and the population per square mile, as well as rural and urban, and compares the figures with the census of 1901. The second table shows a population of sub-districts by conjugal condition.

The following general population figures for Canada by provinces and territories is of interest:

The rural population in 1911 was 3,924,083 and the urban population 3,280,444. In 1901 the rural population was 3,369,018 and the urban population 2,002,297. The increase of rural population in the ten years is therefore 555,065 and of the urban 1,278,147, which is 16.48 per cent. for the former and 63.83 per cent. for the latter.

Comparing the census years of 1911 and 1901, the population of Canada is shown by provinces and territories in the following table, together with the increase in the period of ten years and the increase per cent., viz:

PROVINCES.	1911.	1901.	Increase.	Increase per cent.
Alberta	374,663	73,022	301,641	413.08
British Columbia	392,480	178,657	213,823	119.68
Manitoba	455,614	255,211	200,403	78.52
New Brunswick	351,889	331,120	20,769	6.27
Nova Scotia	492,338	459,574	32,764	7.13
Ontario	2,523,208	2,182,947	340,261	15.58
Prince Edward Island	93,728	103,259	−9,531*	−9.23
Quebec	2,002,712	1,648,898	353,814	21.46
Saskatchewan	492,432	91,279	401,153	439.48
Yukon	8,512	27,219	−18,707*	−68.73
Northwest Territories	16,951	20,129	−3,178*	−15.79
Totals for Canada	7,204,527	5,371,315	1,833,212	34.13

* Decrease

MORTALITY STATISTICS.
1909.

This tenth annual compilation of the Bureau of the Census of deaths in the registration area of the United States has been published. The present report is of special importance because it completes the first ten years for which annual returns have been received and permits the data for individual years to be compared with the aggregate mortality of the decade.

This report of more than 800 pages does not easily lend itself to review, but the following excerpts from the introduction in regard to the work done by the Bureau of the Census for the improvement of mortality sta-

tistics and for the extension of the registration area are of general interest:

"Prior to the establishment, under the permanent Bureau of the Census, of this series of annual reports on vital statistics, the compilations of vital statistics related mainly to the years in which the decennial censuses of population were taken. The series of decennial reports commenced with that for the Seventh Census (1850) and terminated with that for the Twelfth Census (1900), the report for which relates to the census year June 1, 1899, to May 31, 1900, and is entirely distinct from the first annual report for the calendar year 1900. These annual reports have enabled the course of mortality to be followed year by year, thus affording much more valuable information than could be found in the statistics for single years presented only at decennial intervals. The early decennial mortality reports were, moreover, based on the data collected by the enumerators of population, a very unsatisfactory method, but beginning with the census year 1879–1880, the registration records obtained by state and city authorities were utilized to an increasing extent.

"The registration area has increased until it now embraces considerably more than one half (56.1 per cent.) of the total population of the country. During recent years the growth of the area has been rapid, owing to the active coöperation of sanitary and medical organizations and of the state health authorities with the Bureau of the Census. Further growth is expected, as legislation on this subject is either pending or is to be introduced at the next sessions of the Legislatures of certain states.

Year.	Population of continental United States	Population of Registration Area.	
		Number.	Per Cent.
Census year 1879–1880	*50,155,783	*8,538,366	17.0
Census year 1889–1890	*62,622,250	*19,659,440	31.4
Census year 1899–1900	*75,994,575	*28,807,269	37.9
Calendar year 1900		*30,765,618	40.5
Calendar year 1901	†77,747,402	‡31,370,952	40.3
Calendar year 1902	†79,365,396	‡32,029,815	40.4
Calendar year 1903	†80,983,390	‡32,701,083	40.4
Calendar year 1904	†82,601,384	‡33,345,163	40.4
Calendar year 1905	†84,219,378	‡34,052,201	40.4
Calendar year 1906	†85,837,372	†41,983,419	48.9
Calendar year 1907	†87,455,366	†43,016,990	49.2
Calendar year 1908	†89,073,360	†46,789,913	52.5
Calendar year 1909	†90,691,354	†50,870,518	56.1

* As of June 1.
† Estimated as of July 1.
‡ Enumerated or estimated as of June 1 for states taking an inter-decennial census and estimated as of July 1 for the remainder of the registration area.

"The registration area for 1909 consisted of eighteen registration states, the District of Columbia, which is co-extensive with the city of Washington, and fifty-four cities in non-registration states. The list of states is as follows, those that have been added during the decade being indicated by stating in parentheses the year in which they were first included, while

the states not thus indicated have formed part of the registration area since 1900:

California (1906).	Massachusetts.	Pennsylvania (1906).
Colorado (1906).	Michigan.	Rhode Island.
Connecticut.	New Hampshire.	South Dakota (1906).
Indiana.	New Jersey.	Vermont.
Maine.	New York.	Washington (1908).
Maryland (1906).	Ohio (1909).	Wisconsin (1908).

Aside from general inprovement in material and methods of presentation, the most notable achievement of the Bureau of the Census in the field of vital statistics, is the gradual extension of the registration area. For this we owe thanks chiefly to the indefatigable and enthusiastic labors of Dr. Cressey L. Wilbur, Chief of the Divisions of Vital Statistics. Of hardly less importance have been his efforts to secure greater efficiency among registrars.

A NEW DEPARTMENT OF STATISTICS.

On September 16, 1912, the government for the Union of South Africa announced that the former census office will be continued as the Department of Statistics for that country, under the control of Mr. Moffatt, late Director of the Census.

The first step for the establishment of the new department was taken by the late Sir Charles Elliott (General Manager of Railways), who brought the subject of uniformity of South African statistics before the Customs Committee at Pretoria, in 1908. In January of the following year, a statistical and census conference met, attended by delegates from the Transvaal, Orange River Colony, Natal, and Rhodesia. The enabling act —a comprehensive document—was passed by the first Union Parliament in 1910.

The new department will carry out the census at proper times, and in addition collect statistics on all necessary subjects. The *Cape Times* writes: "The formation of the new department of statistics is a big step forward from commercial, industrial, agricultural, and general points of view."

JOHN KOREN.

RECENT FOREIGN STATISTICAL PUBLICATIONS.*

Australia. Bureau of census and statistics.
Census bulletins:
No. 9. Education.
No. 10. Blindness and deafness.
Financial bulletin No. 5.—Summary of Australian financial statistics, 1901 to 1911.
Social statistics bulletin No. 4—Statistics as to education, hospitals, and charities, and law, and crime, 1909.
Conference of statisticians of the several states of Australia. Report, March, 1912.

New South Wales. Statistician's office.
Agricultural and live stock statistics 1911.
Establishment of a superannuation fund for the whole of the government services including the municipal and shire services.
Official year book 1911.
Report of population 31 March, 1912.
Statistical register, 1910, parts 2–13.
Vital statistics, 1911.

South Australia. Statistician's office.
Summary returns of manufactures, 1911.

Western Australia. Government statistician.
Preliminary crop and live stock returns from Western Australia, season of 1911–12.

Austria. Ackerbau-ministerium.
Statistisches Jahrbuch, 1911.
Arbeitsstatistisches Amt.
Bericht über die Tätigkeit, 1911.
Ministerium für öffentliche Arbeiten.
Statistik des Bergbaues, 1910.

Vienna. Statistisches Departement.
Statistisches Jahrbuch der Stadt Wien, 1910.

Basutoland.
Annual report, 1911–12 (Gt. Brit. Colonial office. Colonial report —Annual No. 729).

Belgium. Office du travail.
La dentelle par Pierre Verhaegen.
Office du travail et inspection de l'industrie. Industries de la construction mécanique, tome III, fascicule A: Production de force motrice. Transmission du mouvement. Aspiration et refoulement des fluides. B: Déplacement des matiéres pondéreuses. Organes séparés.

Brazil, Sao Paulo, Brazil (State). Departmento estadual do trabalho.
Boletim. Anno 1—Nos. 1 e 2–4° trimestre de 1911 e 1° trimestre de 1912.

*Received by the Bureau of the Census from June 1 to November 30, 1912.

Bulgaria. Direction de la statistique.
Mouvement commercial de la Bulgarie avec les pays étrangers, mouvement de la navigation par ports et prix moyens dans les principales villes, 1911, 4th trimestre.

Canada. Census and Statistics Office.
Fifth census of Canada, 1911: Vol. I. Areas and population by provinces, districts, and sub-districts.
Commission of Conservation. Report of the 3d annual meeting, 1912.
Department of Agriculture. Report for year ending March 31, 1912.
Department of Customs. Report for the year ending March 31, 1912.
Department of Marine and Fisheries. Report of the meteorological service of Canada, 1908.
Department of Marine and Fisheries. Supplement to the 44th annual report, 1910.
Department of the Interior. Forestry branch.
Bulletin No. 28. Forest products of Canada, 1910.
Bulletin No. 29. Lumber conditions in the lesser Slave Lake region.
Bulletin No. 30. Forest products of Canada, 1911: Pulpwood.
Bulletin No. 31. Forest products of Canada, 1911: Tight and slack cooperage.

Ontario. (Province). Bureau of Industries.
Annual report, 1910, parts 1 and 2.

Quebec (Province).
Documents de la session. Vol. 45, parts II, III, 1912.

China. Inspectorate general of customs.
Returns of trade and trade reports, 1911, part II, Port and trade statistics and reports, Vol. IV, Southern coast ports.
Return of trade and trade reports, 1911, part III, Analysis of foreign trade, Vol. I. Imports.

Cuba. Departamento nacional de sanidad.
Instruccionés populares sobre la peste bubonica y la rabia medios de precaverla.

France. Bureau de statistique général.
Annuaire statistique, 1910.
Ministère du travail et de la prévoyance sociale. Statistique annuelle du mouvement de la population 1911.

Havre. Bureau municipal d'hygiene.
Rapport, 1911.

Gambia. Annual report, 1911. (Great Britain, Colonial Office. Colonial reports—Annual No. 718).

Lyons. Bureau municipal d'hygiène et de statistique.
Statistique, 1910.

France.—Continued.
Rouen. Bureau d'hygiène.
Démographie et statistique médicale, 1911.
Germany.
American association of commerce and trade, Berlin.
Year book, 1912.
Düsseldorf. Statistisches Amt.
Zur wirtschaftlichen und sozialen Entwickelung, 1911.
Frankfurt a. M. Statisticshes Amt.
Die Preisbewegungen auf dem Lebensmittelmarkt zu Frankfurt a. M. und deren Einfluss auf die Haushaltsführung der Bevölkerung. (Beiträge zur Statistik N. F. zehntes Heft.)
Halle a. S. Statistisches Amt.
Die Gemeindeeinkommensteurleistung von Zuzug und Fortzug in Halle a. s. (Beiträge zur Statistik Heft 19.)
Königsberg. Statistisches Amt.
Statistisches Jahrbuch, 1911.
Prussia. Statistisches Landesamt.
Zeitschrift des königlich Preussischen statistischen Landesamts. 52 Jahrg., 1912, Abt. 1.
Saxe-Meiningen. Statistisches Bureau.
Jahresbericht des Gewerbe—aufsichtsbeamten 1911.
Statistik des Herzogtums Sachsen-Meiningen. Band 12, nr. 4, 5.
Germany. Statistisches Amt.
Statistisches Jahrbuch, 1912.
Stettin. Magistrat.
Bevölkerungs-wechsel und Stand der Stadt Stettin, Mai-Sept., 1912.
Great Britain. Board of agriculture and fisheries.
Agricultural statistics, 1911. Vol. XLVI, part III.
Prices of corn, live stock, and other agricultural products in Great Britain.
Same: Vol. XLVI, part IV.
Imports and exports of corn, live stock and other agricultural products.
Annual report of Proceedings under Acts relating to sea fisheries, 1911.
Board of trade.
Annual statement of the navigation and shipping of the United Kingdom, 1911.
Railroad returns, 1911.
Statistical abstract for the United Kingdom in each of the last fifteen years from 1897 to 1911.
Board of trade (Labour department).
15th annual abstract of labour statistics in the United Kingdom, 1910.

Great Britain.—Continued.
Census office.
Census of England and Wales, 1911. Vol. I. Administration areas; Vol. II. Registration areas; Vol. III. Parliamentary areas.
Custom house. Statistical office.
Annual statement of the trade of the United Kingdom with foreign countries and British possessions, 1911, Vol. I.
Factory inspector's office.
Annual report, 1911.
Local government board.
41st annual report, 1911–12, part 1.
Report on isolation hospitals. Supplement to the 40th annual report of the Local Government Board, 1910–11.
Malta Royal Commission.
Report. May, 1912.
Minutes of evidence.
Appendix B.
Registrar-general.
73d annual report of births, deaths, and marriages in England and Wales, 1910.
Great Britain. Registrar-general.
Annual summary of marriages, births, and deaths in England and Wales and in London, 1911.
Weekly returns of births and deaths in London and in 94 other great towns. July 6–November 16, 1912.
England. Manchester, Public health officer.
Report, 1911.
Manchester Statistical Society.
Transactions of the Manchester Statistical Society. Session 1911–12 and index.
Preston, Eng. Medical officer of health.
Annual report, 1911.
Royal Statistical Society, London.
Special commission on infantile mortality.
Infantile mortality. Report, 1912.
Salford, Medical officer of health.
Health bulletin, 2d quarter, June, 1912.
Scotland. Census office.
Census of Scotland, 1911:
Vol. 1, part 5, County of Aberdeen.
Vol. 1, part 6, County of Argyll.
Vol. 1, part 7, County of Ayr.
Vol. 1, part 8, County of Banff.
Vol. 1, part 9, County of Berwick.
Vol. 1, part 10, County of Bute.
Vol. 1, part 11, County of Caithness.

Scotland. Census of Scotland, 1911.—Continued.
Vol. 1, part 12, County of Clackmannan.
Vol. 1, part 13, County of Dumbarton.
Vol. 1, part 14, County of Dunfries.
Vol. 1, part 15, County of Edinburgh.
Vol. 1, part 16, County of Elgin.
Vol. 1, part 17, County of Fife.

Scotland. General board of commissioners in lunacy.
54th annual report, 1911.

Glasgow. Medical officer of health.
Corporation of Glasgow, Census, 1911. Report.
Report, 1911.

Hungary. Statisztikai hivatal.
Commerce extérieur des pays de la Sainte Couronne Hongroise, 1910.

Budapest. Statistikai hivatal.
Bestand und Geschäftsergebnisse der Budapester Actiengesellschaften, 1908. (Publicationen Nr. 47.)
Das Unterrichtswesen der Stadt Budapest, 1907–08. (Publicationen Nr. 48.)
Die Bewegung der Bevlökerung in Budapest, 1906–07. (Publicationen Nr. 42.)
Statistisches Jahrbuch, 1912.

India.

Burma. Report of the Sanitary Administration of Burma, 1911.
Superintendent General of Vaccination.
Notes and statistics on vaccination in Burma, 1911–12.
Census Commissioner.
Census, 1911.

India Commercial Intelligence Department.
Annual statement relative to the sea-borne trade and navigation of British India, 1911.
Note on the production of tea in India, 1911.
Review of the trade of India in 1911–12.
Statistics of British India, Part VI, Administrative and judicial.
Department of Explosives.
13th annual report of the chief inspector of explosives for the year ending March 31, 1912.
Department of Mines.
Report of the chief inspector of mines, 1911.

Lucknow.
Annual administrative report, 1912.

Ireland. Census office.
Census of Ireland, 1911.
Province of Munster:
County and city of Limerick.
County of Tipperary.

Ireland.—Continued.
Department of Agriculture and Technical Instruction.
Agricultural statistics for Ireland with detailed report for the year 1911.
Agricultural statistics. 1912.
Produce of the hay crop in Ireland, 1912.
Railway and railway statistics, 1911.
Return of prices and crops, live stock, etc., 1911.
Report of proceedings under the diseases of animals acts, 1911.
Inspector of Lunatics.
61st annual report, 1911.
Local Government Board.
Annual report for the year ending March 31, 1912.
Returns of local taxation in Ireland, 1910–11.
Jamaica. General Register Office.
Census of Jamaica and its dependencies 3d April, 1911.
Japan. Bureau de la statistique générale.
État de la population de l'empire du Japon au 31 décembre, 1908.
Mouvement de la population de l'empire du Japon, 1909.
Résumé statistique de l'empire du Japon, 1911.
Statistique des causes de décès de l'empire du Japon, 1909, tome 1, 2.
Department of Finance.
12th financial and economic annual, 1912.
Mexico. Direccion general de estadistica.
Noticia del movimiento de sociedades mineras y mercantiles, 1886–1910.
Netherlands.
Amsterdam. Bureau municipal de statistique.
Jaarcijfers, 1911.
Netherlands. Departement van landbouw, nijverheid en handel.
Uittreksel uit het verslag voor het stoomwezen, 1911.
Newfoundland. Acts of the General Assembly of Newfoundland passed in the second year of the reign of His Majesty, King George V.
Department of Marine Fisheries.
Annual report, 1911.
Registrar's general's office.
Annual report, 1911.
Norway. Statistiske centralbureau.
Folketællingen i Norge, 1910, förste hefte.
Nyasaland Protectorate. Registrar general's office.
Census, 1911.
Orange Free State.
Johannesburg. Municipal Council.
Minutes of the special meeting May 6, 1912.
Municipal statistics bulletin. June–September, 1912.

Roumania. Direct, iunea statistcel generale a financelor.
Biuroul statisticel comertului exterior.
Comertul exterior al Romaniei, 1910.
Bulletin statistique de la Roumania. Seria III, 1912, Nos. 26, 27.
Ministère de l'industrie et du commerce.
Moniteur commercial Roumain. 15 juillet; 15 september, 1912.

Russia.
St. Petersburg. Bureau municipal de statistique.
Bulletin hebdomadaire July 6–November 2, 1912.
Relevé succinct des donnees statistiques sur la ville de St. Petersbourg, 1911.
Otdiel statistiki i kartografiI.
Chemins de fer. 1909, 2ème pte.
Voies navigables intérieures et chaussées 1909.

Sierra Leone.
Annual report 1911 (Great Britain Colonial Office. Colonial reports—Annual No. 724).

Southern Nigeria.
Annual report of the mineral survey 1910 (Great Britain Colonial Office. Colonial reports—Miscellaneous No. 83).

Southern Rhodesia.
Preliminary returns of census, 1911.

St. Helena.
Annual report 1911 (Great Britain Colonial Office. Colonial reports—Annual No. 714).

Sweden.
Gothenburg. Hälsovårdsnämds.
Årsberättelse, 1911.

Uganda Protectorate. Census office.
Census returns, 1911.

Union of South Africa. Census office.
Census, 1911. Part 2, Ages of the people.
Part 3, Education of the people.
Part 4, Conjugal condition of the people.

Uruguay. Direccion general del registro del estado civil.
El movimiento del estado civil y la mortalidad, 1911.

Transvaal. Chamber of Mines.
22d annual report, 1911.